

b.) Remarks

Claims 1, 8 and 15 have been amended in order to recite the present invention with the specificity required by statute. Additionally, new claims 43-60 are presented in order to more specifically recite various preferred embodiments of the present invention.

The subject matter of the amendment is set forth in the specification as filed, *inter alia*, at page 10, lines 1-22, page 17, lines 1-13. Accordingly, no new matter has been added.

Claims 1-6, 8-13, 15-20, 22-28, 30-33, 35-38 and 41-42 are rejected under 35 U.S.C. §103 as being obvious over any of Lee, Librecht, Arai, Ishii or Guerrero for the reasons noted. Claims 7, 14, 21, 29, 34 and 39 are rejected as being obvious over this art in view of Berglund.

This rejection is respectfully traversed. However, prior to setting forth their bases for traversal, Applicants would like to briefly discuss the salient features of the present invention and accordingly, its patentable nature over the prior art.

As is well-understood, salted foodstuff is a significant health hazard, the ingestion of which is associated with hypertension and vascular disease. As such, salt is best avoided whenever possible. Unfortunately, consumers enjoy and expect salty flavoring in their foods. Prior art “imitation salts” or salt substitutes are intended to replace salt by providing a salty taste but without the concomitant health risks; however, they do not adequately duplicate the flavor of salt.

The present invention is intended to address this deficiency in the prior art. Broadly speaking, the present invention relates to use of a novel isolated acidic peptide having a molecular weight of 400 to 30,000 with a proportion of acidic amino acids of at least 20%, and in which the number of acidic amino acids is greater than the number of

basic amino acids. Applicants have found that use of such peptide unexpectedly enhances the salty flavor of foods and beverages.

These features are not taught or suggested in the prior art, as discussed *seriatim* below.

Lee teaches (column 3, lines 6-10) “that hydrolysates containing highly flavorful impurities are to be avoided . . . only the L forms of aspartic acid and arginine are effective in the present invention.” Indeed, Lee’s examples all illustrate use of L form aspartic acid and arginine, e.g., free amino acids. Thus, Lee does not teach use of peptides despite the Examiner’s assertion to the contrary (“...it is not seen at this time that the above amino acids are not in peptide form”). In any event, Lee plainly does not teach or suggest an acidic peptide having a molecular weight of 400 to 30,000, or having at least 20% acidic amino acids, or having more acidic than basic amino acids.

In support of the rejection over Liebrecht, the Examiner states “it is not seen at this time that peptides are not produced by this method because the proteins are broken down with the use of acids. Therefore, it would have been obvious to add an acidic peptide to a food or beverage as shown.”

However, it is plainly certain that breakdown of proteins with acids does not inherently, e.g., necessarily produce acidic peptides and it is even more certain that breakdown of proteins does not necessarily produce peptides having molecular weight of 400-30,000, or having at least 20% acidic amino acids, or having more acidic than basic amino acids.

As to Ishii, the Examiner states that wheat gluten is hydrolyzed into peptide fractions which are added “to a soup stock to enhance its saltiness (umami).” First, respectfully submitted, the Office Action appears confuse “saltiness” with “umami.” Food is considered to have five basic tastes, that is, sweetness, saltiness, sourness, bitterness and

umami. Umami is translated as “good taste”, not enhanced saltiness. In any event, the “hydrolyzed” wheat gluten is no more relevant than the disparate teachings of Lee and Liebrecht.

Arai is relied upon as showing hydrolyzing and neutralizing proteins “to make peptides and free amino acids and to remove amino acids to make a brothy peptide that serves as a seasoning like MSG.” However, Arai is no more relevant than was Ishii, discussed above. That is, Arai explicitly teaches (page 1255, left column, lines 4-9) such processes produce “...acidic oligopeptides in powder . . . This powder had a brothy taste in spite of the absence of free amino acids, especially of free glutamic acid, and tasted still slightly bitter” and (at page 1255, left column, bottom paragraph) that “the acidic oligopeptide fraction was chromatographed . . . to isolate the factors responsible for the brothy and bitter tastes.”

Accordingly, at best Arai provides a method to enhance brothy or bitter tastes using oligopeptides, but not to enhancing salty taste. Moreover, Arai does not teach or suggest a peptide having a molecular weight of 400 to 30,000, or which has at least 20% acidic amino acids, or having more acidic than basic amino acids.

As to Guerrero, which the Examiner argues relates to a salt enhancer using a proteolysed protein, Applicants respectfully submit this is overstatement. In fact, at page 2, lines 24 to 27 Guerrero states:

“We have found that the product of the proteolysis of a protein source . . . , is capable of producing free basic amino acids, when added to a food or beverage containing less than a normal amount of sodium chloride, will enhance the salty taste . . . ”

Thus, Guerrero only teaches use of amino acids and in fact, Guerrero is even less relevant than Lee since it teaches use of basic amino acids.

Moreover, these deficiencies are not overcome by the secondary reference to

Berglund, which is relied upon only for showing additional of succinic acid to amino acid compositions containing lysine.

Accordingly, there is no *prima facie* obviousness as to the subject matter of the amended claims. However, even if there was, *arguendo*, a *prima facie* case of obviousness made out, such is clearly overcome by the evidence already of record herein which establishes the unexpected superiority of the present invention over the closest relevant embodiments found in the prior art.

That is, Example 1 conclusively illustrates that the effect of the present invention is not obtained by using a mixture of amino acids containing the same concentrations of amino acids as found in the acidic peptide recited in the pending claims. The Examiner's attention is respectfully invited to specification, page 24, line 10 to page 25, line 8 where the following test result is described: the test solution in Example 1 was found to have the salty taste equivalent to that of a 0.125 mol/l salt solution; in contrast an aqueous solution comprising 0.1 mol/l salt, 0.012 g/l arginine, 0.007 g/l lysine and 0.148 g/l aspartic acid was prepared and evaluated; and it gave no salt enhancement.

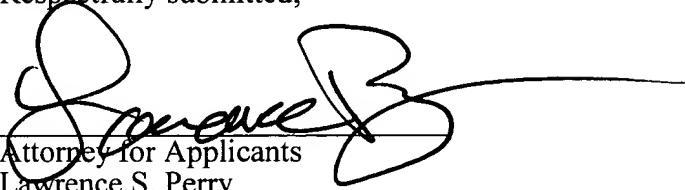
This test result shows that an aqueous solution comprising free amino acids give no salty taste enhancement, whereas the present invention provided 25% enhancement. This result is plainly of great utility to the skilled artisan and unexpected in view of the prior art.

In view of the above amendments and remarks, Applicants submit that all of the Examiner's concerns are now overcome and the claims are now in allowable condition. Accordingly, reconsideration and allowance of this application is earnestly solicited.

Claims 1-24 and 43-60 remain presented for continued prosecution.

Applicants' undersigned attorney may be reached in our New York office by telephone at (212) 218-2100. All correspondence should continue to be directed to our below listed address.

Respectfully submitted,



Attorney for Applicants
Lawrence S. Perry
Registration No. 31,865

FITZPATRICK, CELLA, HARPER & SCINTO
30 Rockefeller Plaza
New York, New York 10112-3801
Facsimile: (212) 218-2200

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